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10/587,079	07/21/2006	Norikatsu Takaura	XA-10616	9411
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MILES & STOCKBRIDGE PC 1751 PINNACLE DRIVE SUITE 500 MCLEAN, VA 22102-3833			LAURENZI, MARK A	
ART UNIT	PAPER NUMBER			
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/587,079	Applicant(s) TAKAURA ET AL.
	Examiner MARK A. LAURENZI III	Art Unit 2894

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 21 July 2006.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-18 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. 10/587,079.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/146/08)
Paper No(s)/Mail Date _____

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____

5) Notice of Informal Patent Application

6) Other: _____

DETAILED ACTION

This 1st Non-Final office action is in response to Application No. 10587079 filed 07-21-2006.

Claim Objections

Claims 6 and 15 are objected to because of the following informalities: claims 6 and 15 recite in part, the following limitation(s): “*a memory device according to claims 1 and 10, further comprising a region, in adjacent to the memory layer, in which the content of Zn or Cd is higher by 10 at % or more than that of the layer of the memory layer containing Zn or Cd.*” It is suggested that “*in adjacent*” is improper claim language and that deletion of the word “*in*” will effectively overcome this objection. Appropriate correction is required. For examining purposes claims 6 and 15 will be read as: “*a memory device according to claims 1 and 10, further comprising a region, adjacent to the memory layer, in which the content of Zn or Cd is higher by 10 at % or more than that of the layer of the memory layer containing Zn or Cd.*”

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-5, 10, 12-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. U.S. 5,278,011 and further in view of Kozicki et al. U.S. 6,418,049 B1.

FIG. 3

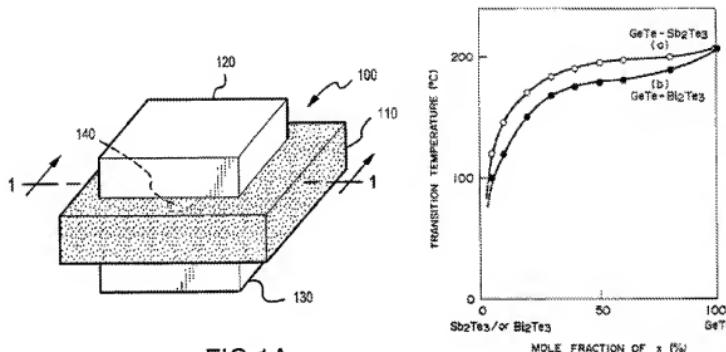


FIG. 1A

In re claim 1, Yamada (Fig. 3) discloses: a memory device including a memory element comprising: a memory layer 110 containing 2 at% or more and less than 25 at% of at least one element selected from the group consisting of Ge (Ge, Fig. 3), Sb, and Bi, 40 at% or more and 65 at% or less of Te (Te, Fig. 3), and 20 at% or more and 50 at% or less of at least one element selected from the group 2b, group 1b, groups 3a to 7a (Sb, Fig. 3), and group 8 elements, and storing information by causing reversible phase-change (Abstract) between a crystal phase (crystal, Abstract) and an amorphous (amorphous, Abstract) phase but is explicitly silent with respect to an electrode formed on both surfaces of the memory layer. However, Kozicki (e.g. Fig. 1A) discloses an electrode (120, 130) formed on both surfaces of a memory layer 110. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the memory device including a memory layer as taught by Yamada with the memory layer including Ge, Sb and Te as taught by Kozicki for the benefit of forming a memory device

that can operate under a wide range of temperature conditions since the material as disclosed by Yamada has a transition temperature that can be adjusted (by composition) to suit a wide range of operational temperatures (Fig. 3).

In re claim 3, Yamada in view of Kozicki is explicitly silent with respect to a memory device according to claim 1, wherein the group element comprising the group 2b, group 1b, groups 3a to 7a, and group 8 elements are partially or entirely replaced with nitrogen. It would have been obvious to one having ordinary skill in the art at the time the invention was made to entirely or partially replace the group 2b, group 1b, groups 3a to 7a, and group 8 elements with nitrogen, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges (e.g. concentration of nitrogen) involves only routine skill in the art. *In re Aller, 105 USPQ 233 (1955)*.

In re claim 4, Yamada in view of Kozicki discloses: a memory device according to claim 1, wherein the memory layer contains 5 at% or more and less than 20 at% of at least one element selected from the group consisting of Ge (Yamada, Ge, Fig. 3), Sb and Bi, 45 at% or more and 60 at% or less of Te (Yamada, Te, Fig. 3), 25 at% or less of at least one element selected from the group 2b, group 1b, groups (3a to 7a)(Yamada, Sb, Fig. 3) and group 8 elements.

In re claim 5, Yamada in view of Kozicki discloses: a memory device according to claim 1, wherein the memory device is used within an atmosphere at 145°C or higher (100-200 °C, Fig. 3).

In re claim 10, Yamada (Fig. 3) discloses: a memory layer containing 2 at% or more and less than 25 at% or less of Ge (Ge, Fig. 3) and Sb (Sb, Fig. 3), 40 at% or more and 65 at% or less of Te (Te, Fig. 3), and at least one element selected from 20 at% or more and 50 at% or less of

the group 2b, group 1b, groups 3a to 7a (Sb, Fig. 3), and group 8 elements, and storing information by causing reversible phase-change (Abstract) between a crystal (crystal, Abstract) phase and an amorphous (amorphous, Abstract) phase but is explicitly silent with respect to an electrode formed on both sides of the memory layer. However, Kozicki (e.g. Fig. 1A) discloses an electrode (120, 130) formed on both surfaces of a memory layer 110. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the memory device including a memory layer as taught by Yamada with the memory layer including Ge, Sb and Te as taught by Kozicki for the benefit of forming a memory device that can operate under a wide range of temperature conditions since the material as disclosed by Yamada has a transition temperature that can be adjusted (by composition) to suit a wide range of operational temperatures (Fig. 3).

In re claim 12, Yamada in view of Kozicki is explicitly silent with respect to a memory device according to claim 10, wherein the group element comprising the group 2b, group 1b, groups 3a to 7a, and group 8 elements are partially or entirely replaced with nitrogen. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to entirely or partially replace the group 2b, group 1b, groups 3a to 7a, and group 8 elements with nitrogen, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges (e.g. concentration of nitrogen) involves only routine skill in the art. *In re Aller, 105 USPQ 233 (1955)*.

In re claim 13, Yamada in view of Kozicki discloses: a memory device according to claim 10, wherein the memory layer contains 5 at% or more and less than 20 at% of Ge (Ge, Fig. 3) and Sb (Sb, Fig. 3), 45 at% or more and 60 at% or less of Te (Te, Fig. 3), and 25 at% or less

of at least one element selected from the group 2b, group 1b, groups 3a to 7a, and group 8 elements but is explicitly silent with respect to nitrogen. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form material with at least a portion of nitrogen contamination, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges (e.g. concentration of nitrogen) involves only routine skill in the art. *In re Aller, 105 USPQ 233 (1955)*.

In re claim 14, Yamada in view of Kozicki discloses: a memory device according to claim 10, wherein the memory device is used within an atmosphere at 145°C or higher (100-200 °C, Fig. 3).

In re claim 17, Yamada (Fig. 3) discloses: a memory device including a memory element comprising: a memory layer 110 containing Ge (Ge, Fig. 3), Sb, 40 at% or more of Te (Te, Fig. 3), and 20 at% or more and 50 at% or less of at least one element selected from the group 2b, group 1b, groups 3a to 7a (Sb, Fig. 3), and group 8 elements, and storing information by causing reversible phase-change (Abstract) between a crystal phase (crystal, Abstract) and an amorphous (amorphous, Abstract) phase but is explicitly silent with respect to an electrode formed on both surfaces of the memory layer. However, Kozicki (e.g. Fig. 1A) discloses an electrode (120, 130) formed on both surfaces of a memory layer 110. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the memory device including a memory layer as taught by Yamada with the memory layer including Ge, Sb and Te as taught by Kozicki for the benefit of forming a memory device that can operate under a wide range of temperature conditions since the material as disclosed by Yamada has a transition

temperature that can be adjusted (by composition) to suit a wide range of operational temperatures (Fig. 3).

In re claim 18, Yamada in view of Kozicki and Kinoshita is explicitly silent with respect to a memory device according to claim 17, wherein an insulating film is disposed between the memory layer and one surface of the electrode. However, Yamada (Fig. 1A) discloses a dielectric layer 2/3 situation upon a memory layer 4. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a memory device including a memory layer that is separated from surrounding electrodes so as to insulate or to suppress charge leakage from the memory material in as far as to improve an aspect of volatility.

Claims 2, 6, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Kozicki as applied to claims 1 and 10 above, and further in view of Wada et al. U.S. 4,529,991.

In re claim 2, Yamadad in view of Kozicki is explicitly silent with respect to a memory device according to claim 1, wherein one element selected from the groups is Zn or Cd of the group 2b. However, Wada discloses: a composition of a recording material which that may include Zn (clm. 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the element Zn or Cd since it is known that the groups 2b, group 1b, groups 3a to 7a, and group 8 elements as recited in claim 1 comprise a finite number of identified, predictable potential solutions (e.g. possible elements from which to select) to the recognized need or problem thus satisfying the requirement for a finding as set forth by the MPEP § 2143 E.

In re claim 6, Yamada in view of Kozicki discloses a memory layer (Yamada, 110) but is explicitly silent with respect to a memory device according to claim 1, further comprising a region, adjacent to the memory layer, in which the content of Zn or Cd is higher by 10 at % or more than that of the layer of the memory layer containing Zn or Cd. However, Wada discloses: a composition of a recording material which that may include Zn (clm. 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the element Zn or Cd since it is known that the groups 2b, group 1b, groups 3a to 7a, and group 8 elements as recited in claim 1 comprise a finite number of identified, predictable potential solutions (e.g. possible elements from which to select) to the recognized need or problem thus satisfying the requirement for a finding as set forth by the MPEP § 2143 E. Further, Yamada discloses a memory layer (Fig. 3). To further clarify the disclosure of Yamada, "it is well settled that the term 'a' or 'an' ordinarily means 'one or more'." Tate Access Floors, Inc., and Tate Access Floors Leasing, Inc., v. Interface Architectural Resources, Inc., 279 F.3d 1357; 2002 U.S. App. LEXIS 1924; 61 U.S.P.Q.2D (BNA) 1647 ((citing Tate Access Floors, Inc. v. Maxcess Techs., Inc, 222 F.3d 958, 966 n.4, 55 U.S.P.Q.2D (BNA) 1513, 1518 [**32] (citing Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 977, 52 U.S.P.Q.2D (BNA) 1109, 1112 (Fed. Cir. 1999): "As we have previously explained, it is generally accepted in patent parlance that 'a' or 'an' can mean 'one or more'.")). And, "This court has repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.' Unless the claim is specific as to the number of elements, the article 'a' receives a singular interpretation only in rare circumstances when the patentee evinces a clear intent to so limit the article." (Citations omitted). Scanner Technologies

v./COS Vision Systems, 365 F.3d 1299, 1304 (Fed. Cir. 2004). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the concentration of Zn or Cd within a layer so as to facilitate for provision of operability in accordance with and in the form of **routine** experimental **optimum workable ranges**, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233 (1955).

In re claim 11, Yamadad in view of Kozicki is explicitly silent with respect to a memory device according to claim 10, wherein one element selected from the groups is Zn or Cd of the group 2b. However, Wada discloses: a composition of a recording material which that may include Zn (clm. 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the element Zn or Cd since it is known that the groups 2b, group 1b, groups 3a to 7a, and group 8 elements as recited in claim 1 comprise a finite number of identified, predictable potential solutions (e.g. possible elements from which to select) to the recognized need or problem thus satisfying the requirement for a finding as set forth by the MPEP § 2143 E.

In re claim 15, Yamada in view of Kozicki discloses a memory layer (Yamada, 110) but is explicitly silent with respect to a memory device according to claim 10, further comprising a region, adjacent to the memory layer, in which the content of Zn or Cd is higher by 10 at % or more than that of the layer of the memory layer containing Zn or Cd. However, Wada discloses: a composition of a recording material which that may include Zn (clm. 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose

the element Zn or Cd since it is known that the groups 2b, group 1b, groups 3a to 7a, and group 8 elements as recited in claim 1 comprise a finite number of identified, predictable potential solutions (e.g. possible elements from which to select) to the recognized need or problem thus satisfying the requirement for a finding as set forth by the MPEP § 2143 E. Further, Yamada discloses a memory layer (Fig. 3). To further clarify the disclosure of Yamada, “it is well settled that the term ‘a’ or ‘an’ ordinarily means ‘one or more’” Tate Access Floors, Inc., and Tate Access Floors Leasing, Inc., v. Interface Architectural Resources, Inc., 279 F.3d 1357, 2002 U.S. App. LEXIS 1924; 61 U.S.P.Q.2D (BNA) 1647 ((citing Tate Access Floors, Inc. v. Maxcess Techs., Inc, 222 F.3d 958, 966 n.4, 55 U.S.P.Q.2D (BNA) 1513, 1518 [**32] (citing Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 977, 52 U.S.P.Q.2D (BNA) 1109, 1112 (Fed. Cir. 1999): “As we have previously explained, it is generally accepted in patent parlance that ‘a’ or ‘an’ can mean ‘one or more’.”)). And, “This court has repeatedly emphasized that an indefinite article ‘a’ or ‘an’ in patent parlance carries the meaning of ‘one or more’ in open-ended claims containing the transitional phrase ‘comprising’” Unless the claim is specific as to the number of elements, the article ‘a’ receives a singular interpretation only in rare circumstances when the patentee evinces a clear intent to so limit the article.” (Citations omitted). Scanner Technologies v./COS Vision Systems, 365 F.3d 1299, 1304 (Fed. Cir. 2004). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the concentration of Zn or Cd within a layer so as to facilitate for provision of operability in accordance with and in the form of **routine** experimental **optimum workable ranges**, since it has been held that where the general conditions of a claim are disclosed in the prior art,

discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233 (1955).

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Kozicki as applied to claim 1 above, and further in view of Mikoshiba et al. U.S. 5,225,273.

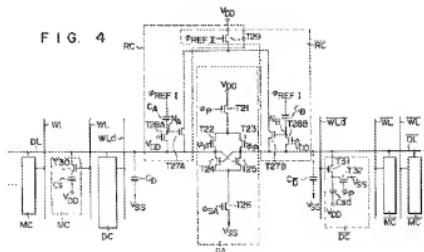
In re claim 7, Yamada in view of Kozicki is explicitly silent with respect to: a memory device according to claim 1, wherein the memory device transmits 30% or more of recording light or reading light. However, Mikoshiba discloses: a transparent electrode col. 3/lls. 55-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the memory device including an electrode as taught by Yamada in view of Kozicki with the transparent electrode as taught by Mikoshiba for the benefit of enhancing the device structure by incorporating a transparent electrode that is durable and has stable electrical properties with respect to mechanical stress. Yet, Yamada in view of Kozicki and Mikoshiba are explicitly silent with respect to the transmittance properties of the memory layer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a composition for a memory layer that is transparent, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

In re claim 16, Yamada in view of Kozicki is explicitly silent with respect to: a memory device according to claim 10, wherein the memory device transmits 30% or more of recording light or reading light. However, Mikoshiba discloses: a transparent electrode col. 3/lls. 55-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to combine the memory device including an electrode as taught by Yamada in view of Kozicki with the transparent electrode as taught by Mikoshiba for the benefit of enhancing the device structure by incorporating a transparent electrode that is durable and has stable electrical properties with respect to mechanical stress. Yet, Yamada in view of Kozicki and Mikoshiba are explicitly silent with respect to the transmittance properties of the memory layer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a composition for a memory layer that is transparent, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

In re Boesch, 617 F.2d 272, 205 USPO 215 (CCPA 1980).

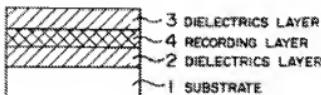


Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Kozicki as applied to claim 1 above, and further in view of Kinoshita U.S. 4,475,178.

In re claim 8, Yamada (Fig. 3) discloses: a plurality of memory device including a memory element wherein each of the plurality of memory cells includes: a memory layer containing Ge (Ge, Fig. 3) or Sb, 40 at% or more of Te (Te, Fig. 3), 20 at% or more and 50 at% or less of at least one element selected from the group 2b, group 1b, groups 3a to 7a (Sb, Fig. 3),

and group 8 elements, and recording information by causing reversible phase-change (Abstract) between a crystal (crystal, Abstract) phase and an amorphous (amorphous, Abstract) phase but is explicitly silent with respect to electrodes formed so as to sandwich the memory layer therebetween for applying a voltage to the memory layer. However, Kozicki (e.g. Fig. 1A) discloses electrodes (120, 130) formed so as to sandwich the memory layer 110 therebetween for applying a voltage to the memory layer (this is implicit). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the memory device including a memory layer as taught by Yamada with the memory layer including Ge, Sb and Te as taught by Kozicki for the benefit of forming a memory device that can operate under a wide range of temperature conditions since the material as disclosed by Yamada has a transition temperature that can be adjusted (by composition) to suit a wide range of operational temperatures (Fig. 3). Yet Yamada in view of Kozicki is explicitly silent with respect to a plurality of data lines arranged orthogonally to the plurality of word lines and reading signals from the plurality of memory cells. However, Kinoshita (e.g. Fig. 4) discloses: a plurality of data lines DL arranged orthogonally to the plurality of word lines WL and reading signals from the plurality of memory cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the memory device including electrodes as taught by Yamada in view of Kozicki with the word line and date line wiring as taught by Kinoshita for the benefit of forming a memory device that can operate controlled under various design orientations so as to expand the versatility and ease of manufacturing said device.

FIG. 1A



In re claim 9, Yamada in view of Kozicki and Kinoshita is explicitly silent with respect to a memory device according to claim 8, wherein an insulating film is disposed between the memory layer and one surface of the electrode. However, Yamada (Fig. 1A) discloses a dielectric layer 2/3 situation upon a memory layer 4. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a memory device including a memory layer that is separated from surrounding electrodes so as to insulate or to suppress charge leakage from the memory material in as far as to improve an aspect of volatility.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARK A. LAURENZI III whose telephone number is (571)270-7878. The examiner can normally be reached on Monday through Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair>-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MARK A. LAURENZI III/
Examiner, Art Unit 2894

5/15/2009

/Kimberly D Nguyen/
Supervisory Patent Examiner, Art Unit
2894